

CLAIMS:

1. A method comprising:
- 2 receiving a first signal having a first frequency and a second signal having a
second frequency, the first and second frequencies being different from a frequency of an
4 incoming RF signal;
- generating at least one local oscillator signal having a frequency determined as a
6 function of the first and second frequencies; and
- generating at least one baseband signal as a function of the local oscillator
8 signal and the RF signal.
2. The method of claim 1, wherein the frequency of the local oscillator signal
2 is one of a sum and a difference of the first and second frequencies.
3. The method of claim 1, wherein generating the at least one local oscillator
2 signal comprises generating an in-phase local oscillator signal and a quadrature local
oscillator signal.
4. The method of claim 1, further comprising applying the local oscillator
2 signal to convert the RF signal down to an in-phase baseband signal and a quadrature
baseband signal.
5. The method of claim 1, further comprising generating a quadrature
2 representation of at least one of the first and second signals.
6. A wireless communication device comprising:
- 2 a downconverter to generate at least one baseband signal as a function of an RF
signal and of a local oscillator signal, the local oscillator signal having a frequency
4 determined as a function of first and second frequencies different from a frequency of the
RF signal; and
- 6 a modem to demodulate the at least one baseband signal.

7. The wireless communication device of claim 6, wherein the
2 downconverter comprises a quadrature signal generator to generate in-phase and
quadrature local oscillator signals having a frequency equal to one of a sum and a
4 difference of the first and second frequencies.

8. The wireless communication device of claim 6, further comprising:
2 a first frequency oscillator external to the downconverter and configured to
generate a first signal having the first frequency; and
4 a second frequency oscillator to generate a second signal having the second
frequency.

9. The wireless communication device of claim 8, wherein the second
2 frequency oscillator is integral with the downconverter.

10. A demodulator comprising:
2 a quadrature signal generator to generate in-phase and quadrature local
oscillator signals having a frequency determined as a function of first and second
4 frequencies different from a frequency of an incoming RF signal;
a first mixer to generate an in-phase baseband signal as a function of the in-
6 phase local oscillator signal and the RF signal;
a second mixer to generate a quadrature baseband signal as a function of the
8 quadrature local oscillator signal and the RF signal; and
a modem to demodulate the in-phase and quadrature baseband signals.

11. The demodulator of claim 10, wherein the frequency of the in-phase and
2 quadrature local oscillator signals is one of a sum and a difference of the first and second
frequencies.

12. The demodulator of claim 10, further comprising:
2 a first frequency oscillator to generate a first signal having the first frequency;
and

4 a second frequency oscillator to generate a second signal having the second
frequency.

13. An integrated circuit comprising:
2 a quadrature signal generator to generate in-phase and quadrature local
oscillator signals having a frequency determined as a function of first and second signals
4 having first and second frequencies different from a frequency of an RF signal;
a downconverter to generate in-phase and quadrature baseband signals as a
6 function of the RF signal and of the in-phase and quadrature local oscillator signals; and
a modem to demodulate the in-phase and quadrature baseband signals.

14. The integrated circuit of claim 13, wherein the frequency of the local
2 oscillator signals is one of a sum and a difference of the first and second frequencies.

15. The integrated circuit of claim 13, further comprising a phase shifter to
2 generate a quadrature representation of at least one of the first and second signals.

16. The integrated circuit of claim 13, wherein the quadrature signal generator
2 is coupled to receive the first signal from a first frequency oscillator external to the
integrated circuit and to receive the second signal from a second frequency oscillator.

17. The integrated circuit of claim 16, wherein the second frequency oscillator
2 is integral with the integrated circuit.

18. A processor readable medium containing processor executable instructions
2 for:

receiving a first signal having a first frequency and a second signal having a
4 second frequency, the first and second frequencies different from a frequency of an RF
signal;

6 generating at least one local oscillator signal having a frequency determined as a
function of the first and second frequencies; and

8 generating at least one baseband signal as a function of the at least one local
oscillator signal and the RF signal.

19. The processor readable medium of claim 18, wherein the frequency of the
2 local oscillator signal is one of a sum and a difference of the first and second frequencies.

20. The processor readable medium of claim 18, further containing processor
2 executable instructions for generating an in-phase local oscillator signal and a quadrature
local oscillator signal.

21. The processor readable medium of claim 18, further containing processor
2 executable instructions for applying the at least one local oscillator signal to convert the
RF signal down to an in-phase baseband signal and a quadrature baseband signal.

22. The processor readable medium of claim 18, further containing processor
2 executable instructions for generating a quadrature representation of at least one of the
first and second signals.

23. A wireless communication device comprising:
2 a downconverter configured to
receive a first signal having a first frequency and a second signal having a
4 second frequency, the first and second frequencies different from a frequency of an RF
signal,

6 generate at least one local oscillator signal having a frequency determined
as a function of the first and second frequencies, and

8 generate at least one baseband signal as a function of the at least one local
oscillator signal and the RF signal; and

10 a modem to demodulate the at least one baseband signal.

24. The wireless communication device of claim 23, wherein the frequency of
4 the local oscillator signal is one of a sum and a difference of the first and second
frequencies.

25. The wireless communication device of claim 23, wherein the
2 downconverter is configured to generate an in-phase local oscillator signal and a
quadrature local oscillator signal.

26. The wireless communication device of claim 23, wherein the
2 downconverter is configured to apply the at least one local oscillator signal to convert the
RF signal down to an in-phase baseband signal and a quadrature baseband signal.

27. The wireless communication device of claim 23, wherein the
2 downconverter is configured to generate a quadrature representation of at least one of the
first and second signals.

28. An apparatus comprising:
2 means for receiving a first signal having a first frequency and a second signal
having a second frequency, the first and second frequencies different from a frequency of
4 an RF signal;
means for generating at least one local oscillator signal having a frequency
6 determined as a function of the first and second frequencies; and
means for generating at least one baseband signal as a function of the at least
8 one local oscillator signal and the RF signal.

29. The apparatus of claim 28, wherein the frequency of the local oscillator
2 signal is one of a sum and a difference of the first and second frequencies.

30. The apparatus of claim 28, further comprising means for generating an in-
2 phase local oscillator signal and a quadrature local oscillator signal.

31. The apparatus of claim 28, further comprising means for applying the at
2 least one local oscillator signal to convert the RF signal down to an in-phase baseband
signal and a quadrature baseband signal.

32. The apparatus of claim 28, further comprising means for generating a
2 quadrature representation of at least one of the first and second signals.

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